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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/586,683	07/20/2006	Johannes Buttner	293524US0PCT	8085
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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER				
BROOKS, CLINTON A				
ART UNIT		PAPER NUMBER		
1621				
NOTIFICATION DATE		DELIVERY MODE		
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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# Office Action Summary

**Application No.**

10/586,683

**Applicant(s)**

BUTTNER ET AL.

**Examiner**

CLINTON BROOKS

**Art Unit**

1621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 July 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 7/20/2006
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Status of Claims***

Claims 1-15 are currently pending.

### ***Priority***

The instant application, United States Application Serial No. 10/586,683, filed July 20, 2006 is a national stage application of PCT/EP2005/001017, filed February 2, 2005, which claims benefit of German Patent Application Serial No. GERMAN 102004005913.6, filed February 5, 2004.

### ***Information Disclosure Statement***

The Examiner has considered all references from the IDS statements dated July 20, 2006 that have not been marked with a strikethrough.

### ***Claim Objections***

**Claim 1** is objected to because of the following informalities: Claim 1 should read 0.1 to 10%. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112/Second Paragraph***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

**Claims 1-15** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The reaction product specifies a molecule, mononitrotoluene, how can “the reaction product” a single molecule have a content of toluene, and nitric acid, or anything--it is a single molecule.

**Claim 15** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, claim 15 recites “...from 58 to 100%.” What is the 58 to 100% related to volume, mass, and of what the organic phase, the entire solution, etc.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claim 1, 3-11, 13-15** are rejected under 35 U.S.C. 102(b) as being anticipated by United States Patent No. 4,367,347 (“the ‘347 patent”, made of record on the IDS dated July 20, 2006).

The ‘347 patent teaches a process for preparing dinitrotoluene (column 2, lines 35 to 38 for example), by reacting toluene with nitric acid in the presence of sulfuric acid to give

mononitrotoluene (column 2, lines 39 to 42 for example), separating the reaction product from step a) into an organic phase comprising mononitrotoluene and an aqueous phase comprising sulfuric acid (column 2, lines 43 to 45 for example), reacting the organic phase comprising mononitrotoluene with nitric acid in the presence of sulfuric acid to give dinitrotoluene (column 3, lines 46 to 50), separating the reaction product from step c) into an organic phase comprising dinitrotoluene and an aqueous phase comprising sulfuric acid (column 2, lines 51 to 52 for example), wherein the reaction product from step a) has a content of toluene of 0.1 to 10% by weight based on the organic phase ("0.5 wt% toluene", column 5, lines 43 to 50), and a content of nitric acid of from 0.1 to 1.2% by weight, based on the aqueous phase ("0.1 to 1.0 wt% nitrous and nitric acid", column 5, lines 50 to 60), and the phase separation in step b) is effected in such a way that further reaction of the toluene with the nitric acid is prevented (the phases containing the nitric acid/sulfuric acid are separated from the toluene; column 5, lines 23 to 60). The nitric acid is a requirement for nitration of toluene to proceed.

Note that once "reaction product" has been clarified, claim 2 may be included in this rejection.

Further, the '347 patent teaches dynamic separators (for example column 5, lines 36 to 42, also for example Figure 2, element 55), transferring from step b) to step c) without purification (column 5, lines 43 to 49), reusing the aqueous phase containing sulfuric acid (for example column 5, lines 50 to 60), stirred tanks (Figure 2, 50 and 52), one reactor for each step see (FIG. 2, 50 and 62), step a) at 40-70 degrees Celsius (column 5, lines 36 to 43), step c) at to 90 degrees Celsius preferably about 70 degrees (column 5, lines 60 to 65), molar ratio of nitric acid to toluene at stage a) of 0.95-1.12 (column 5, lines 23 to 30, 140 liters of toluene (density

0.8669 g/mL) to 90 liters of nitric acid (density at 100% 1.513 g/mL) at 60% strength calculates to a molar ratio of 1.02, reconcentrating the sulfuric acid to from 85-96% and recycled (90-98 wt %, column 5, lines 50 to 60, and recycling see for example element **14** or figure 2, **46**), nitric acid from 58 to 100% (60-90%, column 5, lines 25 and 56 for example).

***Claim Rejection - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**Claim 12** is rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent No. 3,367,347 ("the '347 patent", made of record on the IDS dated July 20, 2006) in view of United States Patent No. 5,689,018 ("the '018 patent").

The '347 patent teaches as disclosed above. Those teachings are incorporated by reference herein.

With respect to the molar ratio of nitric acid to mononitrotoluene in stage c) in the range between 1.03 and 1.10 the '347 patent teaches 60% aqueous solution of nitric acid at about 100 L/min (column 5, lines 56 to 57). Further, the '347 patent teaches that "the organic phase **56** which contains about 0.5 wt % unreacted toluene, 20 wt % DNT and 80 wt % mononitrotoluenes passes through line **58** at about 190 L/min..." (column 5, lines 43 to 45). From these teachings one can reason that 60 L/min of nitric acid is present and 152 L/min of mononitrotoluene is present (80% of 190 L/min). Thus, 60 L of about nitric acid and about 190 L of mononitrotoluene are present in the same time frame. Calculating the mols of nitric acid:  $(60000 \text{ mL} * (1.513 \text{ g/mL}) = 90780 \text{ g nitric acid} / (63.02 \text{ g/mol}) = 1440.5 \text{ mol nitric acid}$ . Calculating the mols of mononitrotoluene:  $(152000 \text{ mL} * (0.8669 \text{ g/mL}) = 131768.8 \text{ g} / (137.14 \text{ g/mol}) = 960.8 \text{ mols}$ . Thus, the equivalents  $1440.5/960.8 = 1.5$  equivalents of nitric acid to mononitrotoluene. The '347 patent also teaches that lower molar ratios of nitric acid may be used to convert toluene to mononitrotoluene (1.02 equivalents at 60% strength).

The '347 fails to teach a molar ratio between 1.03 and 1.10 for step c).

The '018 patent teaches that 1.08 moles of nitrating acid can be used in the process to

convert mononitrotoluene to dinitrotoluene (example 1, for example) wherein the molar ratio of 1.08 mols is maintained throughout the process and dinitrotoluene is isolated.

It would have been prima facie obvious to one having ordinary skill in that art at the time the invention was made to used 1.08 moles of nitrating agent because one skilled in the art would reduce the quantity of nitrating agent needed and thereby reduce the cost and material waste associated with the process. One would expect success in the combination because the reaction and the reagents are the same.

### *Conclusions*

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CLINTON BROOKS whose telephone number is (571)270-7682. The examiner can normally be reached on Monday-Friday 8:00 AM to 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, DANIEL SULLIVAN can be reached on (571)272-0779. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the



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If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Cab

/Daniel M Sullivan/

Supervisory Patent Examiner, Art Unit 1621